INTRODUCTION

Introduction to biomaterials in all medical aspects of cardiothoracic training has an outstanding impact on human health as well as a considerable economic importance. Aim: To present a real, reusable and low-cost biomaterial useful as a tool in teaching-learning training programs for lung plethysmography and mechanical ventilation.

MATERIAL AND METHODS

Five cardiopulmonary blocks were harvested from rabbit, dog and cat, whom were at the end of non cardiopulmonary-related research studies realized under the Technical Specification for the Care and Use of Laboratory Animals of the Mexican Official Norm (NOM-062-ZOO-1999). The blocks were submerged and treated with McCormick solution and impregnation with glycerine for 30 to 40 days. After this, cardiopulmonary blocks were connected to a volume ventilator to ensure good lung compliance and no leakage. Based on the dimensions of the cardiopulmonary blocks, an acrylic plethysmograph (height 20cm, 12cm diameter, 0.6mm thick acrylic and volume of 2,200 ml) was designed. In the box cover (16x16cm) three ¼ inch holes were made. Cardiopulmonary blocks were placed in the plexiglass box (through the trachea) in one of the holes, an endotracheal tube 4Fr was connected to a ventilator (Viasys Respiratory Care) and the lungs were insufflated under three different inspiratory ranks (14, 16 and 18 cmH20). In the second drilling an extension was connected to a suction pump and in the third hole a sphygmomanometer was adapted, then inspiratory volume was calculated.

RESULTS

After treatment with McCormick solution and glycerine, the cardiopulmonary blocks maintain their structural integrity. Lungs are elastic pieces that have a smooth texture with distension and insufflation capacities, however it was necessary to increase the inspiratory pressure to twice (vs. value required for blowing lung under normal conditions) and the compliance was reduced.

CONCLUSIONS

This biomaterial is functional and reusable for teaching-learning lung plethysmography and mechanical ventilation practices.

Keywords: Biomaterial, Cardiopulmonary Block, Teaching-Learning

References: